PUBLIC HEALTH ASSESSMENT

NAVAL STATION TREASURE ISLAND
HUNTERS POINT ANNEX
SAN FRANCISCO COUNTY, CALIFORNIA

APPENDIX D

IR and PA Areas

IR-8 (PCB Spill Area)/OU II/Parcel D

The intersection of Hussey Street and Manseau is the location of IR-8, the PCB Spill Area. The PCB Spill Area is located southeast of former building 503 and the north corner of former Building 508, the base laundry. Building 606, which presently occupies the area, was utilized by the Military Postal Service during Operation Desert Storm. The PCB spill was discovered, by the Navy, in 1986 during an underground repair operation (16). The sources of the PCBs were most likely from a former transformer pad on-site and transformers of two power poles, north and southeast of the area. Another possible source of contamination is a steamline, which may have been used to transport PCB containing waste oils and which may have ruptured in the vicinity of former Building 503 (26).

IR-9 (Pickling and Plate Yard)/OU II/Parcel D

The Pickling and Plate Yard, 120,000 square feet in size, is in the center of the base, on the north end of Hussey street between Buildings 411 and 402. This area was operational from 1947 to 1973 and used for industrial metal finishing and painting activities. Area structures include one empty above ground acid storage tank, three fluid filled below grade brick-lined pickling tanks housed in as open concrete emergency contaminant vault, two plate storage racks, six plate drying racks, and an overhead crane system (28).

Pickling involves dipping the steel plates into acid tanks. The plates were then dried on racks then painted with zinc chromate based corrosion resistant primer. The area is underlined with concrete and asphalt. Sodium dichromate, sulfuric and phosphoric acids, and zinc chromate were used on site. Most of the structures are coated with acid and zinc chromate. Before the separation of a combined sewer system in 1977, almost 15,000 gallons of acid contaminated rinse water were discharged to the combined sanitary/storm sewer system each month into the bay (28).

Base tenants occupy the buildings bordering the area. Plans are for removal of the pickling tanks contents, the zinc chromate residue on all structures, and the rainwater in the containment vault, then dismantling and disposing of the empty pickling tanks and racks (28).

IR-7 (Sub-Base Area)/OU IV/Parcel B

The Sub-Base Area is next to the bay at the northern edge of the base and northwest of Donahue

Street. This IR area is composed of three subareas the Sandblast and Plating Area, the Sandblast Fill Area, and the Additional Area.

Painting Area The Sandblast Area is in the eastern portion of the area. It is a rectangular shaped area, 120 by 80 feet, flat and paved. This area is adjacent to Buildings 144 and 146.

Sandblast Fill Area The Sandblast Fill Area constitutes two fifths of the Sub-Base Area. Irregularly shaped, this area is bordered by Donahue Street to the southeast, the Additional Area to the west, and the bay to the north and descends towards and bay. Recreational vehicles have been parked on the paved wedge in the south portion of the area; access to the vehicles take up the remaining portion of the area.

Additional Area The Additional Area is bordered by the San Francisco Bay to the east, Donahue Street to the southeast, the HPA property line to the northwest, and a parking area to the southwest. There is a fenced in helicopter pad on the northwestern corner of the area. Triple A parked its recreational vehicles of the paved areas.

When the Sub-Base Area was operational, submarine superstructures were painted with zinc chromate based paints in the painting area. Paint spills occurred. In addition, diesel fuels spills may have occurred during painting operations of fuel lines (16). The Sandblast and Additional areas were used for disposal areas for sandblast wastes generated from the Sandblast Area. It was thought that sandblast waste from ships exposed to nuclear detonations at Bikini Atoll may be present, but current radiological testing has not identified levels of radioisotopes associated with disposal of those materials (4).

IR-11 (Building 521 Power Plant)/Group 5/Parcel E

Building 521 is an unpaved area of about 1 acre in the southern portion of HPA on J Street. This structure formerly housed a high-pressure boiler that generated electricity from 1950 to 1969. Steam and fuel lines run between Tank S-505 and the former power plant. Building 521 is no longer in use. Asbestos was used to insulate the steam generation system. There was a 400 to 500 pound mound of insulation outside of Building 521 which was removed in 1990 (23). There are fifteen, 5-gallon cans of xylene, paint, and metal conditioner stored outside the plant.

IR-13 (Old Commissary)/Group 5/Parcel E

The Old Commissary area is 0.7 acres in size and in the southern section of HPA. It is a triangular shaped area bounded by I Street on the east, Manseau Street on the northwest, and J Street on the south. The commissary building was demolished between 1979 and 1978, only the foundation remains (23). One slab of the foundation was turned into a decontamination facility for base RI activities, and is enclosed by a fence. IR-13 was used as a storage yard before construction of the commissary in 1948 or 1949 (23). The remaining area is unpaved. During the Triple A leasing of the HPA, transformers, possibly containing PCBs, were stored on the eastern side of the area (7). Drums of oily dirt were stored at the area; sandblast waste was stored on concrete pads.

IR-14 (Oily Liquid Waste Disposal Area)/Group 5/Parcel E

Northwest of IR-11 and southeast of Building 505, the Oily Liquid Waste, 4.5 acres in size, is in the southern portion of the base. IR-14 is situated between H and J Streets and west of IR-15, the Oily Waste Pond and Incinerator Tank. In an open gully area between Buildings 505 and 521, Triple A reportedly dumped oily liquid waste (7). Later this gully area was filled with sand. The

actual location of the gully can not be determined from the existing surface conditions or aerial photographs. Drums, transformers, and chemical canisters may have been disposed of on location. There is no visual evidence of these past disposal activities (22).

IR-15 (Oily Waste Pond and Incineration Tank)/Group 5/Parcel E

The Oily Waste Ponds and Incineration Tank areas are in areas northwest and northeast of IR-11, Building 521. The Oily Liquid Waste Ponds area was a military housing area beginning around 1946; the buildings were torn down in 1976 or 1977 (23). Ponds of oily water were first observed in 1986 by the San Francisco District Attorney (22). Reportedly, a 2.5 inch diameter hose from Tank S-505 (PA-47), south of Building 521, had been used to fill the ponds with waste oils (7). Tank S-505 has been removed. Evidence of these ponds are no longer observable. The area is flat and vegetated. The SWAQAT performed from 1988 to 1989 did not indicate the presence of any landfill gas or surface and subsurface migrations at IR-15 (23).

In the northeast portion of this area, two trash cans, a tank, and a dumpster were seen on 4 April 1986. The tank had been used as an incinerator. The tank, dumpster, and trash cans allegedly contained copper plates, circuit boards, x-ray film, and miscellaneous trash (7). The tank was removed from the area in mid-July 1986 leaving behind visible ground staining (22). The time at which the dumpster and trash can were removed is unknown. All of IR-15 is flat and vegetated.

PA-16 (Container Storage Area, Triple A Area 9)/Group 6/Parcel E

PA-16 is on the eastern corner of H and Mahan Streets and is near the southern tip of HPA. The area is a poorly paved and has a fenced area about 0.2 acres in size. Investigations identified 100 drums labeled "PCB-containing" oil and other drums and containers, transformers, some flammable solids, and a 5,000 gallon tank stored at the area. Neither information concerning the exact contents of these containers, nor methods of disposal are known. Presently no containers, tanks, or drums are stored on location. Some areas are stained (124).

IR-17 (Drum Storage and Disposal Area)/Group 5/Parcel D

The Drum Storage and Disposal Area is at the southern tip of HPA, east of the end of H Street and is 1.8 acres in size. No buildings are present on the unpaved site (23). Triple A allegedly dumped drums potentially containing PCBs and transmission oil. Potential point sources include those areas where industrial debris and drums were stored (23). Contents of the other containers were not identified (22). The soil in this area was visibly stained and some debris remains on site (23)

IR-18 (Former PA-18, Waste Oil Disposal Area behind Dago Mary's Restaurant, Unnumbered Triple A Area 9)/Group 6/Parcel B

IR-18 is near the northern tip of HPA and is 3.6 acres. This area is within a paved parking lot adjacent to Donahue Street west of the Sub-Base Area. The restaurant is operational and outside of the contaminated area. Waste oil in amounts up to 100,000 gallons was disposed of at the area by Triple A (7). Later the area was paved over with asphalt (124). Methane has also been detected at IR-18.

PA-19 (Officers Club/Group 6)/Parcel A

Building 901 housed the former Hunters Point Annex Officer's Club. The Officers Club is on a knoll overlooking the southern and eastern portions of HPA. This area is less than one acre. The landscaped parking medians southwest of the Club may have been filled in part with sandblast

waste and oily materials (126). PA-19 was included in the Radiation Survey (4). No further action was recommended for this area (35).

IR-20 (Building 156 and Former Waste Storage Yard)/Group 6/Parcel B

IR-20 is in the northern section of HPA; it is paved and is one-half acre. Prior to 1986, the southwestern portion was leased to the Morgan Chemical Company. A variety of reclaimed waste oils and chemicals were stored here during the Morgan leasing of the area (22). There is a sump pump in Building 156 which is partially filled with a thin layer of sludge. The asphalt surface of the yard is cracked and stained. Old aerial photographs revealed a pond-like feature in 1981 and 1986. Use and origin of this pond is unknown (126).

IR-22 (Buildings 368 and 369)/Group 6/Parcel D

IR-22 is in the southeastern corner of the base and is less than one acre. These buildings were used by the Navy as shop service buildings (126).

PA-24 (Buildings 124, 125, 128, and 130)/Group 6/Parcel B

PA-24 is composed of Buildings 124, 125, 128, and 130 and asphalt paved areas adjacent to them. This area is 10 acres rectangular area and is in the north half of the base.

Building 124 was an acid mixing plant and contained five storage tanks that held sulfuric acid and electrolytes. Former Building 124 stood between Building 123 (IR-10) and Building 134 (PA-25). The building and tanks have been removed. No documentation exists pertaining to the tank removal (10).

Building 125 was a restaurant called the Submarine Cafeteria. Presently the building is leased to a vinegar making company, a woodworking shop, a photographer, and an artist. There are two transformers northeast of the building.

Two shops in Building 128 are leased to the Miller Pipeline company. The Federal Drug Enforcement Agency occupies the larger northwest half of the building and uses it for vehicle impoundment. Two transformers were housed in a room in the eastern half of the building. The door leading into the room has a sign on it stating "contains PCBs". Previously listed chemicals include oils, solvents, corrosives, and hydrocarbons.

Building 130 is occupied by Protective Finishes Company. The building used to house both Engel Engineering and Protective Finishes Company. A variety of chemical were stored at is area, housekeeping practices were poor. There are two sump pumps in the building. Previous inventoried chemical include oils, solvents, paints, VOCs, methyl ethyl ketone, toluene, and hydrocarbons (10).

PA-32 (The Regunning Pier and Building 383)/Group 6/Parcel D

PA-32 is a nearly 8.5 acre location in the central portion of the HPA. The Regunning Pier has a large crane constructed on the pier to remove gun turrets from Navy ships during WWII. Activities that took place at the Regunning Pier include storage of containers of radioactive material from 1950 to 1959 and impact testing of intercontinental ballistic launching systems. Reports indicate that a drum of tar was stored here also. The Navy used Building 383 for shipping and receiving. Now the area was being leased to Westinghouse (10). Addition work will be performed at this area during the RI investigation (127).

PA-36/Group 6/Parcel D

PA-36 covers 17 acres in the west central portion of the base. This area is composed of 8 buildings, their surrounding areas, and an area west of Building 405. Stained areas have been detected at five of the building locations. Addition work will be performed at this PA site during the RI investigation (127).

Building 371 is used for storage by the Circosta Iron Company. Mechanical equipment and debris are scattered over the area. No releases have been reported at this area, but Naval investigators have reported staining in the building vicinity.

Building 400, former SOAP storehouse, is being used the Navy Planning and Engineering of Repairs and Alterations, Pacific Office as a storage area for miscellaneous parts from decommissioned naval and for miscellaneous equipment storage. Past investigations indicated staining on the building floor and adjacent to the building area. Oils, PCBs, and acetylene were used or stored at the area (10).

Building 404A is occupied by Shamrock Enterprises, retail vendors of nuts and bolts. Propane and paints were observed by the Navy at the area. No releases have been reported at this building area.

Building 405 is occupied by Clean Comp Inc., formerly known as Miracle Mushroom. Mushrooms have not been grow there since 1990 (10). The tenants rent farming equipment for off-site soil bioremediation operations. The equipment is stored in and adjacent to building 405. Solvents, hydrocarbons, oil, formaldehyde, and chlorine were used or stored at the building area.

Building 406 is occupied by two different base tenants, Mike's Repair in the northwestern portion and B & A Body Works and Towing in the southeastern portion of the building. The remaining portion of the building is used for automobile storage. Solvents, hydrocarbons, and various other chemical have been used or stored at is area. Ground surface staining was reported in the parking area between Building 406 and 413.

Building 413 is used to store postal service equipment. Previously inventoried chemicals include oil, sludge, and drums. Staining was reported between Buildings 413 and 414. There are several drums of the north side of Building 413 one of which appears to be leaking (10).

Building 414 is used to store drums containing soil cuttings from current SI an RI activities. Fuel oils were once stored in building 414.

Building 704, used for mechanical repair of trucks and other equipment, has been occupied by Wagner Construction for the past 10 years. The company uses the outdoor area for heavy equipment storage. Releases include hydrocarbons, gas, waste oil, solvents, hydraulic oil, batteries, and acid. Naval contractors have observed miscellaneous debris, scrap metal, and leaking mechanical equipment (10).

Area West of Building 405, one acre in size, is between Building 405 and IR-5, the Old Transformer Storage Yard. Building 710 is found on the southern corner of the location. The area contains various debris metal, rubber, wood, and empty containers. No releases have been reported for this area (10).

PA-39/Group 6/Parcel D

Building 505 was formerly the Navy Exchange. The building contained a bowling alley, gymnasium, laundromat, and kitchen. Chemicals were not stored there, but there are transformers at the area. No released have been reported (10). Addition work will be performed at this PA area during the RI investigation (127).

Building 707 was at one time used as an animal clinic. The only chemicals found at this location are five 55-gallon drums labeled detergent that was used for disinfecting and odor control. The drums are empty and no leaks were apparent. Many of the rooms in Building 707 are littered with rags, paint cans and other containers. No released have been reported for the area (10).

Underground Storage Tanks (USTs)

Two UST closure procedures were used, complete removal and removal in place; 19 USTs were removed and 4 USTs were closed in place. Phase I of the UST removal took place in 1991; phase II was completed in September 1993. Procedures for removal included the following: area preparation, soil excavation, UST rinsing, UST purging, UST removal, dewatering, pipe system removal, soil and/ or groundwater sampling, and backfilling and closure. Procedures for closure in place included the following: area preparation, soil excavation, pipe system removal, UST rinsing, soil sampling, UST grout or soil/grout-filling, and backfilling and closure (125).

PA-45 (Steamlines)/Group 6

The steamlines were used to distribute steam heat to HPA buildings. The lines are covered with asbestos containing lagging located within concrete lined pipeline trenches. The asbestos pipe insulation has been stripped away in areas. After use of the system discontinued, steam lines in parcels C, D, and E were allegedly used by Triple A to transport waste oil containing PCBs from Drydock 4, Building 521, the Power Plant, and Berth 29 to Tank S-505 (31). An access hole has shown oil in the area between Drydock 4 and Berth 13. An oil spill occurred in the early 1980s when a steamline was broken during construction activities. The amount of oil spilled is unknown. Reportedly the spill was cleaned up and the lines repaired (9).

In 1987, sampling of contents detected barium, vanadium, nickel, and zinc. Petroleum products detected include gasoline, fuel oil, and grease. During a 1989 walk through of the section of the steamline system that reportedly contains waste oil, a dark oily substance was seen floating on water at the steamline access hole at the intersection of Morrell and Maseau streets (9).

The Navy's inspections of the utility vaults near the Sub Base area and Tank Farm revealed steamlines that appeared to have been cut and cap welded in some locations. Fuel odors were detected in the vaults. Near former Building 503, examination of vaults revealed several lines that had been cut and left uncapped. An exposed portion of an expansion joint was found cut and contained black waste oil. In 1991, access vaults at the intersection of Morrell and Manseau streets were flooded with water displaying a sheen; fuel odors were present (9).

The results the Parcel C 1993 field inspections indicated that no oil was observed within the concrete trenched at the utidors or steamlines and that the lines appeared to be in relatively good condition; friable asbestos was observed at several locations (31).

PARCEL C SITE INVESTIGATION FINDINGS AND RECOMMENDATIONS: Draining of the steam and condensate lines and removing accessible, friable asbestos are recommended (31).

PA-46 (Fuel Distribution Lines, Tank Farms)/Group 6/Parcel B

There are a series of pipelines originating from the Tank Farm that were used to distribute diesel fuel to Berths 55, 56, diesel and lube oil to Berths 57, 58, and an abandoned pier, Berth 60. These pipelines were also used to transport waste diesel and lube oils back to the Tank Farm. A branch of the lines that runs from Berths 57 to 58 to Berth 60 was abandoned prior to 1972; lube lines were abandoned in 1960.

During the Navy area inspections of access vaults, fuel odors were detected in most of the vaults. Staining was observed along a 4 inch line at a subsided area of Berth 62. The condition of the lines was poor; lines were rusted and line labels had faded. Due to the condition of the lines, inspectors found it difficult to distinguish lube and fuel lines from other from utility lines. The fuel lines are not encased in concrete vaults and are buried in the soil. Two fuel lines were identified near Building 134. A break in the fuel line occurred during inspection due to the poor condition of the line. The fluid that escaped appeared to be diesel fuel. The line was plugged, the leaking fuel was contained and placed in a 55 gallon drum. This indicates that fuel is still present in some of the distribution lines (9).

PA-47 (Fuel Distribution Lines, Tank S-505)/Group 6

There are several fuel lines connected to Tank S-505 (IR-15); portions of these lines were removed during the S-505 removal. The lines include or included an 8-inch line from Tank S-505 to the Oil Reclamation Ponds (IR-3), a 4-inch line from Tank S-505 to a storage tank on the west side of Building 521, a 6-inch line from the storage tank into Building 521, and a 2.5-inch line from Building 521 to the storage tank (9). Status of many of the lines is unknown.

PA-48 (Chemical Distribution Lines, Former Building 503)/Group 6

According to EPA, there are chemical distribution lines near former Building 503. In the past, these lines may have contained PCB contaminated oil and may have been broken and abandoned in place. HPA facility maps do not show these lines. The lines may have extended from the northwest corner of Berth 15 and along Manseau Street to Hussey Street, then 350 feet along the west side of Hussey Street, then south to H Street, and finally southwest along H Street to the vicinity of the Power Plant (9).

PA-49 (Fuel Distribution Lines, Buildings 203 and 205)/Group 6/Parcel C

Two segments of the fuel distribution lines were investigated during the Parcel C Site Investigation. Building 203 system extends from Berth 5 to a 210,000-gallon UST at the corner of Nimitz Avenue and C Street. There are three USTs associated with Building 203. Investigations consisted of geophysical investigation and inspecting the suspected line locations to evaluate the presence of the fuel lines, test pitting, and soil sampling. Soil analysis indicated total recoverable hydrocarbon at 5,500 ppm, a hydrocarbon sheen was observed at 5 feet bgs in one test pit. The Navy recommended draining remaining oil from the lines and removing the product lines, additional investigations at three test pits, soil boring, hydropunch samples, and shallow aquifer monitoring (31).

The Building 205 system extends from Berth 2 north along the bay, around the perimeter of Drydock 2, to two associated USTs. Investigations consisted of geophysical investigation and inspecting the suspected line locations to evaluate the presence of the fuel lines, test pitting, and soil sampling. Field inspections indicated that the fuel lines were removed from most locations and a newer fuel line was installed in both utilidors and directly in the ground from Building 205 to 231. Soil analysis indicated elevated levels of metals at one test pit. The Navy recommended

draining remaining oil from the lines and removing the product lines, additional investigations at one test pits, soil boring, hydropunch samples, shallow aquifer monitoring, an a geophysical investigation to evaluate the presence of the suspected fuel line near Berth 3 (31).

The following was adapted from Preliminary Draft Site Inspection Work Plan: PA Other Areas/Utilities (11).

PA-23/BUILDING-AREA: 146/GROUP 6/PARCEL B

Building-Area NAME: TACAN Facility, 5-67

HISTORICAL USE: Photograph development laboratory

CURRENT USE: Storage area for on-site monitoring well installation contractor

POTENTIAL CONTAMINANTS: Possible UST, 2 petroleum aboveground storage tanks (ASTs), paint resins on soil

SUMMARY OF OBSERVATIONS: Several fume hoods on the first and second floors indicate historical chemical use. Two floor plates, unmovable without proper equipment, ere identified in the northwest part of the building. A fuel pump observed at the north exterior corner indicates the probable presence of an UST beneath the pavement nearby. Two ASTs, assumed to have stored diesel and heating oil, are located in secondary containment at the northeast corner. Dispensing hoses from these tanks, however, are not contained and spillage to an adjacent storm drain is apparent. Three ground-level compartments with sealed lids at the south corner have paint or resin surrounding them. Surface stains are present on the asphalt along the northwest exterior of the building. USTs have been removed.

PA-23/BUILDING-AREA: 161/GROUP 6/PARCEL B

Building-Area NAME: Maintenance Service Center, 5-07

HISTORICAL USE: Unknown

CURRENT USE: Demolished

POTENTIAL CONTAMINANTS: None observed

SUMMARY OF OBSERVATIONS: The building site is a soil-covered area similar to surrounding areas. No indications of spills or releases were observed. The building name suggests the possible previous use/storage of hazardous materials.

PA-23/BUILDING-AREA NAME: 162/GROUP 6/PARCEL B

BUILDING-AREA NAME: Paint Storage, S-71

HISTORICAL USE: Unknown

CURRENT USE: Demolished

POTENTIAL CONTAMINANTS: None observed

SUMMARY OF THE NAVY'S OBSERVATIONS: The building is no longer present, and the area is now a boat ramp. Soil formerly beneath the building has been removed and the Navy is not recommending sampling.

PA-25/BUILDING-AREA: 134/GROUP 6/PARCEL B

BUILDING-AREA NAME: Machine Shop and Q & RA; Offices, 5-06,38

HISTORICAL USE: Cal Marine Works Machine Shop

CURRENT USE: Odaco Refrigeration Machine Shop and Storage

POTENTIAL CONTAMINANTS: Sumps, drums, dip tank, machine rooms

SUMMARY OF THE NAVY'S OBSERVATIONS: A large concrete dip tank/degreasing vat labeled "chlorinated materials" built into the foundation drains to a sump that is partially inside and partially outside the building. The tank contains sludge, and the sump contains liquid. Pools of standing oil were observed on the concrete floor near and under machines. The floor tile in one machine room is saturated and deformed by apparent oil and corrosive material.

PA-26/BUILDING-AREA: 157/GROUP 6/PARCEL B

BUILDING-AREA NAME: Q & RA Industrial Lab, Metal Fabrication Branch

HISTORICAL USE: Fabrication of metal products, welding, nondestructive testing lab

CURRENT USE: Not in use

POTENTIAL CONTAMINANTS: Oily sludge and stained soil, transformer, storm drain sediment

SUMMARY OF THE NAVY'S OBSERVATIONS: The interior of the building is covered by a concrete and asphalt floor. A thin veneer of soil covers the asphalt and a storm drain is located near the center of the asphalt area where some staining was observed on the soil. A workbench area with a small fumehood is on the southeast wall. An overturned drum surrounded by stained soil and oily sludge is outside the building on the southeast side.

PA-26/BUILDING-AREA: Area XIV/GROUP 6/PARCEL B

BUILDING-AREA NAME: Area XIV

HISTORICAL USE: Carpentry or Carpenters' shop, drydock work, painting, sandblasting, repair

CURRENT USE: Not in use.

POTENTIAL CONTAMINANTS: Drums containing oil, possible UST, sandblast material

SUMMARY OF THE NAVY'S OBSERVATIONS: Locations visited in this area included Building 141, Dock Shipwright's Shop 5-64; area where Building 142A once stood, Air Raid Shelter; Building 140, Pumphouse for Drydock 3.

Sandblast material was observed in several locations. Storm drains likely contain sandblast material and other sediments.A pressure cylinder and an associated UST possibly used for wood treatment are adjacent to Building 141. Debris suspected of containing asbestos materials is present along the shoreline.

PA-27/BUILDING-AREA: 205/GROUP 6/PARCEL C

BUILDING-AREA NAME: Pump and Compressor Plant-PD2, 5-03

HISTORICAL USE: Boiler House/Steam Generation, Pumphouse used for steam generation and

as a pump house for Drydock 2

CURRENT USE: Not in use

POTENTIAL CONTAMINANTS: Asbestos, lubricating oil, dielectric fluid

SUMMARY OF THE NAVY'S OBSERVATIONS: Evidence of previous asbestos remediation activities is present. Disturbed materials including asbestos dust remain on the floor and in other areas. A pile of scrap switches is on the floor in a puddle of oil. Gear oil remains in lubricating pans beneath large pulley gear motors. A deep subsurface pump room flooded with what appears to be bay water may contain petrochemicals. Soil sampling recommended does not appear appropriate at the present time because the area around the building is paved and no significant staining was observed. Paint was severely chipped and flaking and may contain lead.

PARCEL C SITE INVESTIGATION FINDINGS AND RECOMMENDATIONS: No further actions is recommended, however, removal of the pump chamber water to the Publicly Owned Treated Works is recommended (31).

PA-28/BUILDING-AREAS: 211/253/GROUP 6/PARCEL C

BUILDING-AREA NAME: Electronics, Optical and Ordnance Shops

HISTORICAL USE: Machining, welding, assembly, painting, and fabrication of electronic-, optical, and ordnance-related equipment

CURRENT USE: Not in use

POTENTIAL CONTAMINANTS: Possible UST, painting and process residues, sumps

SUMMARY OF THE NAVY'S OBSERVATIONS: Buildings 211 and 253 are interconnected. Building 253 has six main production floors and a tower. Repair, testing, and fabrication of a variety of electronic-, optical-, and ordnance-related equipment occurred. The two buildings share a common main production floor, 1 large and 2 small paint booths, 2 large dip tanks, 1 large vapor degreaser, resin impregnation tanks, and a parts washer. There are several other process tanks on the third, fourth, and fifth floors of Building 253. The buildings share a common drain system that runs to a large sump on the west end of 253. Sumps on the first floor in Building 253 and in the associated bomb shelter, Building 224, appeared to be collection points for a variety of process waste streams. Fluid was observed leaking from a transformer and an electrical insulator south of Building 2l 1; PCB labels were not present. An UST location is suspected on the basis of an observed fuel dispenser pump in the paint room. A sump built into a curing or drying oven is present in the north-central portion of 211.

PARCEL C SITE INVESTIGATION FINDINGS AND RECOMMENDATIONS: Point source releases of PAHs and VOCs were indicated in soil samples collected adjacent the sump in the southeastern corner of Building 253 and in the room containing labels indicating hazardous materials usage, respectively. Additional investigation was recommended to evaluate the lateral and vertical extent of PAHs beneath the sump (31).

PA-28/BUILDING-AREA: 219/GROUP 6/PARCEL C

BUILDING-AREA NAME: Substation E, 5-03

HISTORICAL USE: Electrical Substation

CURRENT USE: Electrical Substation

POTENTIAL CONTAMINANTS: PCB Transformers

SUMMARY OF THE NAVY'S OBSERVATIONS: This building is secured and keys were unavailable. ERM West (1988) reported three PCB-containing transformers, a sump, and three 55-gallon drums of PCB-containing oil inside. Leaks have occurred on the floor inside, and there are oil stains on the pavement outside.

PARCEL C SITE INVESTIGATION FINDINGS AND RECOMMENDATIONS: A point source of total oil and grease (TOG) was indicated at the stained asphalt east of Building 219. A floor scrape sample contained PCBs. An exploratory excavation is recommended at the stain on the asphalt and additional work is recommended inside the building to evaluate the lateral and vertical extent of PCB contamination (31).

PA-28/BUILDING-AREA: 230/GROUP 6/PARCEL C

BUILDING-AREA NAME: Shop Service

HISTORICAL USE: Machine shop

CURRENT USE: Plastics, machine shop, automotive paint shop

POTENTIAL CONTAMINANTS: Soil stain near storm drain; cracked, stained asphalt.

SUMMARY OF THE NAVY'S OBSERVATIONS: A stain extends from the southwest corner of the building (paint shop area) to a storm drain containing oil and foam. There is a stain on cracked asphalt the southeast corner of the building.

PARCEL C SITE INVESTIGATION FINDINGS AND RECOMMENDATIONS: Arsenic was detected in a surface soil sample at the stained area on cracked asphalt east of the building. However a point source release was not indicated, no further investigation is recommended (31).

PA-28/BUILDING-AREA: 231/GROUP 6/PARCEL C

BUILDING-AREA NAME: Machine Shop, 5-31

HISTORICAL USE: Machining

CURRENT USE: Not in use

POTENTIAL CONTAMINANTS: Lubricant oils, oil releases, multiple subfloor trenching and piping runs, large exterior sump

SUMMARY OF THE NAVY'S OBSERVATIONS: Inside this multi-story, heavy industrial machining building are several air treatment systems, sumps containing lubricant oils under large machinery, a wooden floor soaked with oil, sandblasting rooms, and other sumps and trenches. A large sump at the northeast exterior contains an unknown liquid. Two tanks labeled "phosphate" and "hydrazine" were observed. A red ink-like stain observed on the second floor may be associated with PCBs or metal constituents. A pile of partially combusted orange/pink tailings or shavings was observed behind a large machine at which the presence of organic compounds other than SV0Cs is not suspected.

PARCEL C SITE INVESTIGATION FINDINGS AND RECOMMENDATIONS: Point source

releases of VOCs and SVOCs to both soil and the shallow aquifer are indicated throughout the Machine Shop. Vinyl chloride, TCE, PCE, 1,2-DCE, and benzene were detected in groundwater. Additional work is recommended to investigate potential sources and to evaluate the lateral and vertical extent of VOCs and SVOCs in soil and groundwater. Additional UST investigations were also recommended (31).

PA-28/BUILDING-AREA: 258/GROUP 6/PARCEL C

BUILDING-AREA NAME: Pipe Fitters Shop

HISTORICAL USE: Pipe manufacturing

CURRENT USE: Not in use

POTENTIAL CONTAMINANTS: Dip tank operation, oil stains on northern exterior

SUMMARY OF THE NAVY'S OBSERVATIONS: At the east end of the building is a large degreasing and pickling operation with large dip tanks and drainage sumps. Discoloration and evidence of historical spilling exists. Oil stains from parts dumping are present on surrounding concrete and asphalt on the north exterior. Heavy oil stains exist on the first floor near previous machine indentations. An asbestos fabrication area on the third floor should be surveyed. An electric elevator winch in the tower has a lube oil drip pan containing oil. Floor plates were observed but could not be lifted.

PARCEL C SITE INVESTIGATION FINDINGS AND RECOMMENDATIONS: Point source releases of VOCs were indicated at the boring locations on the east exterior of the building. Additional work is recommended to evaluate the lateral and vertical extent of VOCs in soil. Soil and groundwater along the perimeter of the building will be investigated (31).

PA-28/BUILDING-AREA: 270/GROUP 6/PARCEL C

BUILDING-AREA NAME: Paint Shop, 5-71

HISTORICAL USE: Paint shop

CURRENT USE: Furniture and refrigerator storage

POTENTIAL CONTAMINANTS: Oil stains on asphalt near storm drains; sandblast material; oil and solvent storage

SUMMARY OF THE NAVY'S OBSERVATIONS: Suspected solvent and oil storage in 5- and 55-gallon drums, a sandblast booth and bag-house, and two storm drains were observed at the east exterior of the building. There was evidence that oil- and sandblast-containing runoff enters the storm drains.

PARCEL C SITE INVESTIGATION FINDINGS AND RECOMMENDATIONS: A point source release of Aroclor-1260 was indicated at a near-surface soil at a paint stained asphalt crack. Addition work is recommended to evaluate the lateral and vertical extent of Aroclor-1260 in the soil (31).

PA-28/BUILDING-AREA: 271/GROUP 6/PARCEL C

BUILDING-AREA NAME: Paint Shop Annex

HISTORICAL USE: Painting, sandblasting, curing

CURRENT USE: Storage and office space

POTENTIAL CONTAMINANTS: Possible radioactive materials, transformer sandblast materials, and potentially impacted storm drain

SUMMARY OF THE NAVY'S OBSERVATIONS: There is a "Danger-Radioactive Material" sign at the north end of the building although no evidence, e.g., labelled containers, of radioactive materials was observed. On the southwest side of the building, a sandblast booth storm drain is present about 40 feet laterally down slope of the building. There is a large stain on the asphalt pavement at the exterior of the building.

PARCEL C SITE INVESTIGATION FINDINGS AND RECOMMENDATIONS: Low levels of several organics and concentrations of inorganics were detected. Additional work recommended for the associated USTs (31).

PA-28/BUILDING-AREA: 281/GROUP 6/PARCEL C

BUILDING-AREA NAME: Electronics - Weapons Precision Facility/Machine Shop

HISTORICAL USE: Unknown

CURRENT USE: Storage

POTENTIAL CONTAMINANTS: Exterior sump, soil

SUMMARY OF THE NAVY'S OBSERVATIONS: Harding Lawson Associates (HLA) field inspectors were informed this building was off limits. No ongoing processes were observed in the building; however, remnants of a large air vacuum system exist. The vacuum system may have carried metal or plastic particles that spilled onto the soil. Wooden crates, likely containing weapons parts, were stored on the floor. There is an elevator at the northeast exterior corner. A large vault/sump under the elevator contains liquid.

PARCEL C SITE INVESTIGATION FINDINGS AND RECOMMENDATIONS: Building 281 is occupied by the Defense Logistics Agency. Investigation of the sumps in the interior of the building is recommended; field activities at these locations will be determined following resolution of problems associated with the tenant's property. Additional work for the associated USTs is recommended (31).

PA-29/BUILDING-AREA: 203/GROUP 6/PARCEL C

BUILDING-AREA NAME: Power Plant Substation "H" 503

HISTORICAL USE: Boiler Room

CURRENT USE: Not in use

POTENTIAL CONTAMINANTS: Tank contents

SUMMARY OF THE NAVY'S OBSERVATIONS: There are three aboveground storage tanks on the east side of the building; one tank contains diesel fuel; one tank is marked ORM-E; and the third is a stainless steel acid tank not suspected of containing organic compounds.

PARCEL C SITE INVESTIGATION FINDINGS AND RECOMMENDATIONS: Areas of study included soil beneath two ASTs on the exterior of the building and surface soil inside the kiln room. Low levels of organics and inorganics, PCBs, oil, grease, and lead were detected. An exploratory excavation is recommended for the soil in the kiln. Additional work for the associated USTs is recommended (31).

PA-29/BUILDING-AREA: 217/GROUP 6/PARCEL C

BUILDING-AREA NAME: Sheet Metal Shop

HISTORICAL USE: Sheet metal shop, photoengraving, welding, and painting

CURRENT USE: Warehouse/storage of furniture and other materials

POTENTIAL CONTAMINANTS: Photoengraving dip tank residue, soil discoloration, paint residue, particulates

SUMMARY OF THE NAVY'S OBSERVATIONS: Dipping tanks used for photoengraving may contain metal residues. Soil was observed in the utility floor trench on the west side of the building. A waterfall-type paint booth in the south end of the building may contain paint residue. Floor staining was observed in the welding room. Particulates were present in a bag-house on the east exterior side of the building. A storm drain beneath the exterior stairway on the east side of the building may have received particulates and process runoff. There is a floor sump near the center of the building; its contents are unknown.

PARCEL C SITE INVESTIGATION FINDINGS AND RECOMMENDATIONS: Aroclor-1260 was detected in floor vault samples. Because the floor vaults represent a potential source area additional work is recommended to evaluate the integrity of the floor vaults. Low levels of VOCs, SVOCs, pesticides, PCBs, hydrocarbons, oil, grease, and lead were detected. Additional work should be done at the storm drain;,the storm drain should be included in the parcel-wide evaluation of storm drains and associated potential contamination (31).

PA-29/BUILDING-AREA: 275/GROUP 6/PARCEL C

BUILDING-AREA NAME: Sheet Metal Annex, 5-17; E.E.l. Casting

HISTORICAL USE: Sheet metal fabrication

CURRENT USE: Aluminum casting in sand molds

POTENTIAL CONTAMINANTS: Suspected aluminum oxide alloy powder on floor, drum storage at exterior

SUMMARY OF THE NAVY'S OBSERVATIONS: Aluminum oxide alloy fines are dispersed on the floor and other horizontal surfaces throughout the building and are dropping onto the exterior pavement through seams in the walls; although only aluminum is suspected, additional metals may be resent as well as casting sand containing cyanide. Apparently empty drums and equipment are stored on the pavement in the southwest corner over a storm drain. Leakage to the storm drain was observed. Various spills were observed on the surrounding pavement. A tank pad at the northeast corner and a leaking air compressor on the south side in an open storage shed were observed.

PARCEL C SITE INVESTIGATION FINDINGS AND RECOMMENDATIONS: Several PAHs and

Aroclor-1260 were detected in a near-surface soil sample collected at the crack in the floor. No further work is recommended, although, a point source release was not indicated. At the request of the regulatory agencies, additional investigation of soil beneath the crack in the concrete is recommended (31).

PA-29/BUILDING-AREA: 279/GROUP 6/PARCEL C

BUILDING-AREA NAME: Materials storage racks

HISTORICAL USE: Equipment or product storage, product(s) unknown

CURRENT USE: Not in use

POTENTIAL CONTAMINANTS: Soil discoloration west of building; floor and storm drains

SUMMARY OF THE NAVY'S OBSERVATIONS: The concrete floor has indentations where machinery existed. A trench and floor drain in the center of the building likely connects to a storm drain west of the building. Parts, dip-cleaning baskets, dip tanks, and garbage pails containing oil are stored west of the building.

PARCEL C SITE INVESTIGATION FINDINGS AND RECOMMENDATIONS: Based on the analytical results of the soil and storm drain samples collected at Buildings 279 and 280, a point source release of phenol, has occurred; however, the source is unknown. Additional work is recommended to evaluate the lateral and vertical extent of phenols in the soil and groundwater (if present). A point source release of benzene, toluene, and xylenes has occurred to depths 10.75 feet bgs. Additional work is recommended to evaluate the lateral and vertical extent of contamination, and potential sources. The floor vaults also represent a potential source area and recommendations are made to clean out and evaluate the integrity of the floor vault (31).

PA-29/BUILDING-AREA: 280/GROUP 6/PARCEL C

BUILDING-AREA NAME: Covered Work Area 5-17

HISTORICAL USE: Aluminum cleaning, oil recycling

CURRENT USE: Not in use

POTENTIAL CONTAMINANTS: Floor and pavement stains; collection trench through center of building; drums on north side

SUMMARY OF THE NAVY'S OBSERVATIONS: Signs on the wall indicate that a series of dip/cleaning tanks once existed here. Additional observations include a salt residue buildup in the northwest corner, a dark oily stain along the west wall, which suggests leakage out of the building onto the pavement and into a storm drain west of the building, a trench traversing the center of the building (east-west), a reddish brown stain on the pavement east of the building, drums with oil and metal shavings north of the building, and an oily tar-like buildup along the north exterior edge of the building.

PARCEL C SITE INVESTIGATION FINDINGS AND RECOMMENDATIONS: PA-279, PA-279 and PA-280 were investigated concurrently.

PA-29/BUILDING-AREA: 282/GROUP 6/PARCEL C

BUILDING-AREA NAME: Abrasive Blast Facility

HISTORICAL USE: Sandblasting

CURRENT USE: Not in use

POTENTIAL CONTAMINANTS: Sandblast material

SUMMARY OF THE NAVY'S OBSERVATIONS: A sealed chamber in the building serves as a blasting room. Air in the chamber is evacuated through a raised waffled floor to a large bag-house filtration system adjacent to the chamber. Piles of blasting debris were observed in the building both inside and outside of the chamber. Paint stains are present on the surrounding pavement.

PARCEL C SITE INVESTIGATION FINDINGS AND RECOMMENDATIONS: Carcinogenic PAHs and arsenic were detected. Point source releases are not indicated and no further investigation is recommended (31).

PA-29/BUILDING-AREA: Area bounded by Nimitz, Blandy, and C Streets/GROUP 6/PARCEL C

BUILDING-AREA NAME: Not applicable

HISTORICAL USE: Fuel oil storage vault

CURRENT USE: Vault closed in - place and paved

POTENTIAL CONTAMINANTS: Fuel storage

SUMMARY OF THE NAVY'S OBSERVATIONS: A 210,000-gallon fuel oil storage vault/UST was being closed in place during the site inspection. The interior of the vault was observed being steam cleaned, the liquid was being pumped out, and a soil sampling program was being implemented. At the time of this work plan preparation, the area was paved. Results of soil sample analysis indicated that low levels of TPH, SVOCs, PCBs, and lead were present in four of seven soil samples collected around the perimeter of the vault. Results of the investigation performed near the vault are under review (PRC, 1992). These results will be assessed in conjunction with other sample data collected at PA-29. No sampling is recommended at this time (31).

PA-30/BUILDING-AREA: 241/GROUP 6/PARCEL C

BUILDING-AREA NAME: Forge Shop 5-23, Golden Gate Heat Treating

HISTORICAL USE: Foundry

CURRENT USE: Metal heat treating

POTENTIAL CONTAMINANTS: Asbestos firebrick in foundry area, soil staining, utility trench

SUMMARY OF THE NAVY'S OBSERVATIONS: Approximately one-third of the building is currently occupied by Golden Gate Heat Treating (GGHT), which uses various chemicals that are stored in a metal "flammable cabinet." A quench tank used by GGHT drains into an unlined utility trench system in the floor. The remainder of the building is unoccupied and was a dirt-floored foundry. Stains and discolored soil are present throughout the building interior. On the building's exterior southeast corner, oil was observed oozing from under the walls. Several furnaces inside the building contain asbestos fire brick. A metal-framed structure on the east exterior side of the building appears to have been used as a covered storage area. Metal in this structure appears corroded, and wood flooring appears damaged by chemicals.

PARCEL C SITE INVESTIGATION FINDINGS AND RECOMMENDATIONS: Currently, large equipment in Building 241 is being dismantled by Treasure Island personnel; site visited by HLA following the onset of the SI activities have since revealed two sumps beneath areas where large machinery once resided. The floor vaults represent a potential source area; additional work is recommended to evaluate the integrity of the floor vaults. Soil gas flux measurements around the perimeter of the building were recommended (31).

PA-31/BUILDING-AREA: 114/GROUP 6/PARCEL B

BUILDING-AREA NAME: Office Building

HISTORICAL USE: Unknown

CURRENT USE: Building removed, recreation area with archery, horseshoes, etc.

POTENTIAL CONTAMINANTS: Possible sandblast material

SUMMARY OF THE NAVY'S OBSERVATIONS: The building has been removed. Some evidence of building footings remains. Area has been covered by sand that appears to be sandblasting residue. Nearby Building 113A, is mislabelled as 114 and is occupied by Smith-Emery Test Facility.

IR: 33/BUILDING-AREA: 302/GROUP 6/PARCEL D

BUILDING-AREA NAME: Transportation Shop, 5-02

HISTORICAL USE: Repairing automotive equipment

CURRENT USE: Repairing automotive equipment and contractor office space

POTENTIAL CONTAMINANTS: Waste oil, sump contents, and drummed material

SUMMARY OF THE NAVY'S OBSERVATIONS: Suspected hazardous material or waste areas include a locomotive repair pit containing black sludge, a bag-house in a welding area, lubrication hoses, tanks in sumps below floor level, a battery maintenance room with residual acid salts and possibly metals (especially lead), hydraulic lifts, containers of lube oils and fuel, storage containers for waste oil and solvents (solvent-like odor) outside the building, potential underground storage tanks, and stains on the pavement leading to storm drains. Several pipelines go beneath the concrete floor and are not visually traceable. Particulate matter suspected to contain metals was piled beneath a welding operation bag-house. Sumps will be emptied. Additional work will performed at IR-33 (127).

PA: 33/BUILDING-AREA: 302A/GROUP 6/PARCEL D

BUILDING-AREA NAME: Transportation Shop Annex, 5-02

HISTORICAL USE: Vehicle repair, painting, and sandblasting, Universal Painting and Sandblasting (past tenant)

CURRENT USE: Not in use

POTENTIAL CONTAMINANTS: Potential petroleum product lines or USTs beneath foundation and runoff into storm drains

SUMMARY OF THE NAVY'S OBSERVATIONS: Storm drains on north and south sides of building likely contain waste petrochemicals and paint. Integrity of hydraulic lifts inside building is unknown. Wall-mounted hydraulic lines and gear oil delivery lines may still contain product. USTs have been removed. Floor stains were present in the welding room.

PA: 33/BUILDING-AREA: 304/GROUP 6/PARCEL D

BUILDING-AREA NAME: Service Station, 5-02

HISTORICAL USE: Vehicle service station

CURRENT USE: Not in use

POTENTIAL CONTAMINANTS: Wall mounted pipelines, soil beneath hydraulic lifts

SUMMARY OF THE NAVY'S OBSERVATIONS: USTs have been removed. Source control or soil samples have not yet been collected. Product lines from the dispenser island do not appear to have been removed. The condition of hydraulic lifts on the west side of the building exterior is unknown. Numerous wall-mounted pipelines in the building may contain petrochemicals. Paint is severely chipped and flaking and may contain lead or other heavy metals.

PA: 33/BUILDING-AREA: 364/GROUP 6/PARCEL D

BUILDING-AREA NAME: Radiological Research

HISTORICAL USE: Radiation lab, metallurgy shop

CURRENT USE: Metallurgy shop

POTENTIAL CONTAMINANTS: Liquid contents in sump

SUMMARY OF THE NAVY'S OBSERVATIONS: A large sump on the east side of the building contains water of unknown origin. Sumps will be emptied (127). No odors or oily sheens were observed. Pipes emanating from the building enter trenches that lead to the sump. Interior and exterior of building and sump contents may contain residual radioactivity from previous laboratory activities.

PA: 33/BUILDING-AREA: 411/GROUP 6/PARCEL D

BUILDING-AREA NAME: Steel Shop; Ship Fitters Shop 1 I;

Boilermakers Shop 4l; Welders and Burners Shop 26

HISTORICAL USE: Large machining operations

CURRENT USE: None in the machine area; however, several base tenants occupy a corridor of offices along the northeast side of the building.

POTENTIAL CONTAMINANTS: Large sumps, subsurface contamination

SUMMARY OF THE NAVY'S OBSERVATIONS: Large vaults and sumps are present beneath large hydraulically operated machines and footprints of removed machines. Sumps will be emptied (127). Hydraulic fluid lines and filters extend out of the concrete floor, but their origin and associated storage area were not observed. Tenant operations did not indicate potential

environmental problems. At the east exterior wall, an unidentified pipe that extends out of the ground has an attached cylinder and a relief valve; a 55-gallon drum present to contain overflow from the pipe has overflowed onto the soil below. The material is oily; its origin is unknown. Groundwater samples collected from three piezometers in the northern portion of the building did not indicate contamination. Along the south side of the building are several manholes accessing a subsurface trench that contains standing liquid.

PA: 33/BUILDING-AREA: 418/GROUP 6/PARCEL D

BUILDING-AREA NAME: Q & RA Welding Engineering Facility

HISTORICAL USE: Welding supply storage

CURRENT USE: Administrative office, vehicle maintenance,and vehicle/tank storage for Hydro-Chem Services, Inc. (Tenant)

POTENTIAL CONTAMINANTS: Stained pavement and soil

SUMMARY OF THE NAVY'S OBSERVATIONS: Offices, equipment/parts storage, and a small repair shop exist inside the building. A flammable materials storage shed and solvent parts washer are present. Hydro-Chem operates on the associated paved area as well as adjacent paved areas and performs hose clean out, maintenance, and staging. The pavement is discolored. Portions of the operational areas are within IR-9 and are under investigation.

PA-34/BUILDING-AREA: 351/GROUP 6/PARCEL D

BUILDING-AREA NAME: Electronics Shop

HISTORICAL USE: Steam valve machine company

CURRENT USE: Not in use

POTENTIAL CONTAMINANTS: Drums, containers, and oil-stained floor

SUMMARY OF THE NAVY'S OBSERVATIONS: Portions of the first floor are covered with oil-soaked wood, indicating previous machinery operations. Drums and 5-gallon "flammable" cans are present inside. Photo etching and circuit board production occurred on the second floor. Bags of blue granular material are present; the material looks like copper sulfate.

PA-34/BUILDING-AREA: 366/GROUP 6/PARCEL D

BUILDING-AREA NAME: Boat and Plastics Shop

HISTORICAL USE: Unknown

CURRENT USE: Metal sculpting, welding, metal fabrication, XN Welding (current tenant)

POTENTIAL CONTAMINANTS: Leaking batteries, oil-stained soil and asphalt, oil stains leading to storm drains

SUMMARY OF THE NAVY'S OBSERVATIONS: There are several oil-stained areas around the exterior of the building; some staining appears to have emanated from the building. Several stains lead directly to storm drains. There are also several areas where 55-gallon drums of unknown liquids are stored in the vicinity of storm drains. Additional work will performed at PA-

34 (127).

PA-35/BUILDING-AREA: 274/GROUP 6/PARCEL D

BUILDING-AREA NAME: Decontamination Training

HISTORICAL USE: Unknown

CURRENT USE: Artist/photography studio

POTENTIAL CONTAMINANTS: Floor drains, dark pavement stain on south side

SUMMARY OF THE NAVY'S OBSERVATIONS: A pipe from a raised sump in the building drains to a floor drain. The Navy will be removing the sump (127). A series of in-line floor drains traverses the northeast edge of the building. A dark stain was observed on the pavement outside a garage door on the southwest side. A subsurface vault outside the building on the northeast side contains an unknown liquid. There was no evidence of photochemical use. Additional work will performed at PA-35 (127).

PA-35/BUILDING-AREA: 306/GROUP 6/PARCEL D

BUILDING-AREA NAME: Substation "I," 50-3

HISTORICAL USE: Electrical substation

CURRENT USE: Electrical substation

POTENTIAL CONTAMINANTS: PCB transformer leaks, sandblast material

SUMMARY OF THE NAVY'S OBSERVATIONS: One large transformer with PCBs exists in the building over a gravel bed; the gravel is stained. It is unknown whether there is containment beneath the gravel. There is an unnumbered shack on skids behind the substation. Sand in and around the shack may be sandblast waste.

PA-35/BUILDING-AREA: Area bounded by Manseau, Morrell, and E Streets/GROUP 6/PARCEL D

BUILDING-AREA NAME: Not applicable

HISTORICAL USE: Unknown

CURRENT USE: Storage

POTENTIAL CONTAMINANTS: Stained soil, sandblast material, and storm drain

SUMMARY OF THE NAVY'S OBSERVATIONS: The area is fenced and presently used for storage. A wooden building near the north part of the area contains possible asbestos stored in a box. A large metal box has an oily stain on the soil below it. Cylindrical hoppers in the southwest part of area contain black sand. This sand-like material appears to be granular obsidian but could be a metallic or plastic composite. Sand that may be sandblast material covers much of an area near the hoppers.

PA-37/BUILDING-AREA: 401/GROUP 6/PARCEL D

BUILDING-AREA NAME: Public Workshop, 5-03 & 5-07

HISTORICAL USE: Portion used as print shop, remainder unknown

CURRENT USE: Cabinet-building shop, metal fabrication, sheet metal shop, furniture storage, artists' studios

POTENTIAL CONTAMINANTS: Storage drum

SUMMARY OF THE NAVY'S OBSERVATIONS: The northeast portion of the building is a former print shop. Lacquer thinner and contact adhesive are stored in a metal cabinet in the sheet metal shop. A bag-house is present at the southwest corner of the building. The area along the north side of the building appears to be a dumping area for old computer and electronics equipment. One 55-gallon drum, approximately one-third full of an unidentified substance, is present on the north side of the building. Evidence of staining and runoff to a storm drain near the northeast corner was observed.

PA-37/BUILDING-AREA: 423/GROUP 6/PARCEL D

BUILDING-AREA NAME: Compressor Hut and Paint Storage, 5-11

HISTORICAL USE: Unknown; likely contained an air compressor for spray-painting operations

CURRENT USE: Not in use

POTENTIAL CONTAMINANTS: Near Pickling and Plate Yard

SUMMARY OF THE NAVY'S OBSERVATIONS: The building is near IR-9 where a soil and groundwater investigation is ongoing. The building is labeled "Flammable Storage," indicating its use at one time. The building is now empty. No further sampling or analyses are recommended at this time (127).

PA-37/BUILDING-AREA: 435/GROUP 6/PARCEL D

BUILDING-AREA NAME: Equipment Storage, 5-07 HISTORICAL USE: Unknown

CURRENT USE: Furniture, metal paint, and vehicle storage; paint booth

POTENTIAL CONTAMINANTS: Painting operation

SUMMARY OF THE NAVY'S OBSERVATIONS: A painting operation and chemical storage exist in the building. A white-stained area on the pavement appears to drain from the building to the storm drain on the west end. Current tenants of the building report that this storm drain backs up after storms. An exposed patch of soil on the north side of the building may have received runoff. A sump/vault is located in the east portion of the building. Additional work will performed at Building 435 (127).

PA-37/BUILDING-AREA: 436/GROUP 6/PARCEL D

BUILDING-AREA NAME: Material Storage, 5-07

HISTORICAL USE: Painting and paint storage

CURRENT USE: Storage of wood and building materials, small workshop area

POTENTIAL CONTAMINANTS: Paint and solvents on floor

SUMMARY OF THE NAVY'S OBSERVATIONS: Painting and paint storage existed at the east end of building. The remainder of the building is used for lumber storage or houses workshops. Concrete flooring in Building 436 was cracked and damaged. Additional work will performed at Building 436 (127).

PA-38/BUILDING-AREA: 500/GROUP 6/PARCEL D

BUILDING-AREA NAME: GPO Barracks

HISTORICAL USE: Barracks

CURRENT USE: Not in use

POTENTIAL CONTAMINANTS: None

SUMMARY OF THE NAVY'S OBSERVATIONS: These are abandoned two-story barracks with no evidence of present or past use of hazardous materials. Removal of an UST behind the building (southeast corner) was in progress during HLA's visit. Soil sampling beneath an aboveground tank was recommended in Appendix A, Table 4 of the Preliminary Draft Site Inspection Plan: PA Other Areas/Utilities, Volume III: 26 Sites. No evidence of the AST or stained soil was observed. Paint chips were observed on the soil beneath the exterior walls. SI results recommend this area be included in the Navy's lead abatement program (127).

PA-38	BUILDINGS:	506 - Radiological Research/Housing, Navy Exchange & ROICC Offices 507 - Radiological Research/Public Works Office 509 - Radiological Research/Library 510 - Radiological Research/Naval Investigation Service

HISTORICAL USE: Unknown

CURRENT USE: Buildings have been demolished

POTENTIAL CONTAMINANTS: None observed

SUMMARY OF THE NAVY'S OBSERVATIONS: These buildings have been demolished. There is no evidence of hazardous materials; however, soil sampling was recommended near Buildings 506 and 507. Analyses were not specified. IR-14 and PA-38 boundaries overlap at the Building 506 and 510 footprints; sampling has been performed as part of RI activities at IR-14. Analytical results will be used to assess the need for further investigations in these areas. Any further investigation will be addressed as part of RI activities in IR-14. Building names suggest the possible presence of radiation at these areas.

PA-40/BUILDING-AREA: 527/GROUP 6/PARCEL E

BUILDING-AREA NAME: Substation

HISTORICAL USE: Substation

CURRENT USE: Substation

POTENTIAL CONTAMINANTS: Transformers, electrical switches

SUMMARY OF THE NAVY'S OBSERVATIONS: Three unlabeled transformers and a multiphase

electric switch box in the building were observed to have leaked onto the building's foundation.

PA-40/BUILDING-AREA: Pier 2/GROUP 6/PARCEL E

BUILDING-AREA NAME: Not applicable

HISTORICAL USE: Ship berths

CURRENT USE: Ship berths

POTENTIAL CONTAMINANTS: 55-gallon, 10-gallon, and 5-gallon containers

SUMMARY OF THE NAVY'S OBSERVATIONS: Several 55-gallon petrochemical drums were present on the south side of Building 527. Five- and 10-gallon containers of petrochemicals were also present between Berths 34 and 35. The entire pier is over water and covered with asphalt. No significant stains or other problems were identified on the pier. Utility lines under the pier may pose an environmental threat to bay water depending on their contents and integrity. No sampling is recommended; however, storage containers should be properly labelled identifying their contents and stored appropriately if hazardous.

PA-41/BUILDING-AREA: 816/GROUP 6/PARCEL A

BUILDING-AREA NAME: NRDL High Voltage Accelerator/Radiological Defense Laboratory

HISTORICAL USE: Unknown

CURRENT USE: Not in use

POTENTIAL CONTAMINANTS: Radiation

SUMMARY OF THE NAVY'S OBSERVATIONS: No evidence of chemical use in the building was observed. A round subsurface concrete pit is present on the east end of the building. It apparently did not contain liquids, because electrical lights were built into the walls. No sampling is recommended. The building title suggests the possible presence of radiation at this area.

PA-41/BUILDING-AREA: 818/GROUP 6/PARCEL A

BUILDING-AREA NAME: Chlorination Plant

HISTORICAL USE: Unknown

CURRENT USE: None, building demolished

POTENTIAL CONTAMINANTS: Color variations in soil

SUMMARY OF THE NAVY'S OBSERVATIONS: This is a small shack with a concrete foundation. A 1971 HPA map shows a circle adjacent to the shack, which is assumed to be a chlorine tank for water treatment. The tank is now gone. No indications of nearby soil impacts were observed. No sampling is recommended by the Navy.

PA-42/BUILDING-AREA: 109/GROUP 6/PARCEL B

BUILDING-AREA NAME: Harbor Sales and Leasing; Police Station

HISTORICAL USE: Police Station

CURRENT USE: Sales and leasing office/real estate office

POTENTIAL CONTAMINANTS: Oil/water mixture reservoir

SUMMARY OF THE NAVY'S OBSERVATIONS: This building appears to house offices. No evidence of use of hazardous materials was observed. Indications are that an "oil/water mixture reservoir" with a capacity of approximately 100 gallons was abandoned. No evidence of the reservoir was observed.

PA-42/BUILDING-AREA: 113/GROUP 6/PARCEL B

BUILDING-AREA NAME: Tug and Sub Maintenance, Salvage Divers, Substation 5

HISTORICAL USE: Machine shop, torpedo maintenance shop, offices, and electrical substation

CURRENT USE: Portions of southwest side of building used as storage areas; remainder of building is unoccupied

POTENTIAL CONTAMINANTS: Oil and grease, chemically pitted floor stains

SUMMARY OF THE NAVY'S OBSERVATIONS: Several grease or chemical stains were observed on the floor in the southeast corner of the building near a sink. Some solid chemical residue is also present. The floor in the stained area is pitted and damaged. Floor drains may contain oil and other residue. One floor drain in a restroom is clogged, and water is backed up on the floor. A partly disassembled torpedo was observed near the center of the building; however, no associated leaks or evidence of release were observed. Several large oil-covered lathes are in the south end of the building. Some X-ray equipment (apparently belonging to the tenants of 113A) is stored on the west side. On the building's west exterior side is a sign indicating "Radiation Area". A substation on the west side contains a power switch labelled "diesel oil," which could be associated with an UST. No UST(s) is listed in the removal or closure program.

PA-43/BUILDING-AREA: 906/GROUP 6/PARCEL A

BUILDING-AREA NAME: Gardening Tool House

HISTORICAL USE: Storage, repair of gardening tools, pesticide mixing

CURRENT USE: Not in use

POTENTIAL CONTAMINANTS: Soil

SUMMARY OF THE NAVY'S OBSERVATIONS: Building was used to store gardening and landscaping equipment. Rubble has been dumped around the edge of the building. Signs in the dirt-floored room indicate that pesticides and fertilizers were stored and mixed in the building. The building has been removed. Soil was excavated to a depth of 6" near the shed. Samples were collected; results are not yet available (14).

PA-44/BUILDING-AREA: Area near Buildings 408, 409, 410/GROUP 6/PARCEL D

BUILDING-AREA NAME: Not applicable

HISTORICAL USE: Apparently for welding

CURRENT USE: Demolished

POTENTIAL CONTAMINANTS: Sandblast material and debris

SUMMARY OF THE NAVY'S OBSERVATIONS: Buildings 409 and 410 housed generators for welding. Building 4l I, adjacent to the north, housed a large metals machining operation. There was evidence of sandblasting activity in Building 438 and a nearby unnumbered building. A large crane track ran through the area, indicating that large items could have been brought into the area for welding and sandblasting. Sandblast material will be addressed in the Navy's sandblast grit fixation program (128). Four storm drains observed in the area could likely have received sandblast materials for a number of years. Storm drains will be addressed during the RI investigation (127). No indication of liquid releases on the concrete-covered area were observed.

PA-44/BUILDING-AREA: 438/GROUP 6/PARCEL D

BUILDING-AREA NAME: Metal Spray Shelter, 5-Il

HISTORICAL USE: Sandblasting

CURRENT USE: Not in use

POTENTIAL CONTAMINANTS: Sandblast waste

SUMMARY OF THE NAVY'S OBSERVATIONS: Evidence of sandblasting activity was observed in the building. A sealed blasting hood is present.

PA-51/BUILDING-AREA: Former Locations of PCB-Containing Transformers/GROUP 6

BUILDING-AREA NAME: Different areas of HPA

HISTORICAL USE: PCB-containing transformers

CURRENT USE: Not applicable

POTENTIAL CONTAMINANTS: Presence of PCBs from releases prior to transformer removal

SUMMARY OF OBSERVATION: A total of 118 PCB-containing transformers were removed from HPA. Records listed 48 PCB-containing transformers removed from "Building 524 Yard." It is likely that transformers from several areas were removed and stored near Building 524 and then removed from HPA at a later date. Correlation of removal lists with inventory lists may enable identification of original locations for removed transformers.

PARCEL C SITE INVESTIGATION FINDINGS AND RECOMMENDATIONS: During Parcel C SI site visits, eight locations suspected of potential releases were identified. Soil samples were collected at these locations and analyzed for PCBs. Results of the soil analysis indicate the PCBs were detected in four samples. The Navy recommended performing exploratory excavations at PA51SS15 through -SS17 (31).

PA-53/BUILDING-AREA: 525/GROUP 6/PARCEL D

BUILDING-AREA NAME: Storehouse, Code 1029

HISTORICAL USE: Unknown

CURRENT USE: Storage

POTENTIAL CONTAMINANTS: Floor stains

SUMMARY OF THE NAVY'S OBSERVATIONS: The interior of the building is divided into cage-style holding areas. Containers of adhesives, joint compound, paint, emulsions, and other unknown materials are present in these holding areas. Minor floor stains were observed near two holding areas. Two monitoring wells installed as part of the SI at PA-I6 (HLA, 1992) are present approximately 25 feet northwest of the building. A summary of groundwater analytical data for metals is included in this exhibit. (No organics were detected in samples from these wells). Organic compounds were not detected. Grease-containing electrical winches for wrapping and tightening ship lines are on the ground. Additional work will performed at PA-53 buildings and areas (127).

PA-53/BUILDING-AREA: 530/GROUP 6/PARCEL D

BUILDING-AREA NAME: Public Works Building; Automotive Hobby Shop

HISTORICAL USE: Unknown, automotive repair

CURRENT USE: Not in use

POTENTIAL CONTAMINANTS: Floor stains, stains on pavement

SUMMARY OF THE NAVY'S OBSERVATIONS: The building has overhead garage doors on either side indicating historical automotive repair activities. Two minor chemical stains were observed on the floor. Large oil stains are present on damaged asphalt pavement at the northeast and southwest ends of the building.

PA-54/BUILDING-AREA: 511A/GROUP 6/PARCEL E

BUILDING-AREA NAME: Woodworking hobby shop

HISTORICAL USE: Woodworking hobby shop

CURRENT USE: Demolished

POTENTIAL CONTAMINANTS: Potential soil contamination

SUMMARY OF THE NAVY'S OBSERVATIONS: Building 511A has been demolished; only the foundation remains. Miscellaneous debris has been dumped at the area.

PA-55/BUILDING-AREA: 307/GROUP 6/PARCEL D

BUILDING-AREA NAME: Electronic Assembly

HISTORICAL USE: Electronic Assembly, Machine Shop

CURRENT USE: Storage

POTENTIAL CONTAMINANTS: Oil on floor and exterior pavement

SUMMARY OF THE NAVY'S OBSERVATIONS: The building is used by Westinghouse for storage. Partially full drums on the north side of the building have leaked oil onto the asphalt. The concrete in the machine shop is soaked with oil. A Westinghouse employee indicated that the previous tenant, Triple A, filled underground vaults west of the building with hazardous materials and then paved them over. Additional work will performed at PA-55 building and area (127).

PA-56/BUILDING-AREA: AREA VII, RAILROAD TRACKS/GROUP 6/PARCEL E

BUILDING-AREA NAME: Area VII, Railroad Tracks

HISTORICAL USE: Lumber transport and storage

CURRENT USE: Railroad car museum and restoration; parts storage

POTENTIAL CONTAMINANTS: None observed

SUMMARY OF THE NAVY'S OBSERVATIONS: No evidence of hazardous materials releases was observed; however, in the past, the railroad yard was used for lumber loading/unloading, and wood preservatives such as PCP may have been used.

IR: 57/BUILDING-AREA: DRYDOCK 4 AREA/GROUP 6/PARCEL C

BUILDING-AREA NAME: Not applicable

HISTORICAL USE: Ship repair

CURRENT USE: Not in use

POTENTIAL CONTAMINANTS: Sandblast material

SUMMARY OF THE NAVY'S OBSERVATIONS: The entire area is paved. There is evidence of dispersed sandblast material on the asphalt. Storm drains likely contain sandblast debris. An oil stain from a leaking transformer on the northeast side extends to a storm drain. ACM wrapping was observed on steam pipes associated with water tanks on each side of the drydock area. A large hopper containing black sandblast sand exists at the north corner of the site. On the west corner is an empty tent-like structure labelled "hazardous waste accumulation area." Minor oil and paint stains were observed on the pavement. There were no hazardous wastes stored in the tent-like structure.

PA-58/BUILDING-AREA: Scrap Yard Across from Building 258/GROUP 6/PARCEL C

BUILDING-AREA NAME: Not applicable

HISTORICAL USE: Unknown; medical dispensary once existed at Bldg. 210

CURRENT USE: Storage/disposal of miscellaneous items

POTENTIAL CONTAMINANTS: Oil stains on soil and miscellaneous debris

SUMMARY OF THE NAVY'S OBSERVATIONS: Most of the site has an asphalt or concrete surface with a few utility vaults and storm drains. Some of the accumulated materials have been segregated by type - scrap metals (aluminum and copper), manufacturing equipment, abandoned automobiles, motors, scrap wood, office equipment, and fire extinguishers. In one area, it appears several drums of tar were emptied onto the soil. Several damaged insulators leaking oil were observed on the site. Other debris observed on the surface included plates from a damaged lead-acid battery, a leaking oil drum, and a large piece of equipment that is leaking oil.

PARCEL C SITE INVESTIGATION FINDINGS AND RECOMMENDATIONS: Point source releases may have occurred at several locations. The variety of chemicals detected in the surface soil samples, such as VOCs, PAHs, pesticides, PCBs, hydrocarbons, oil, grease, lead, and zinc indicate more than one source area. Additional work is recommended to evaluate the lateral and vertical extent of contamination in the soil. The storm drain (PA58SW06) may represent a source

area for VOCs (including vinyl chloride) and additional work is recommended to evaluate the configuration of the storm drain associated soil contamination (31).

APPENDIX E Radiation Overview

Radiation Overview

Because radiation has been found at many HPA areas and because many people are unfamiliar with radiologic terms, a brief overview is presented here. All matter is composed of atoms. An atom is the smallest particle a chemical element can be divided and still retain the properties characteristic of the element. The basic particles of an atom are protons, neutrons, and electrons. The quantity of those particles combined with their energy state determine the stability or instability of the atom. If an atom is unstable, it can break down into a more stable atom. When that happens, the unstable atom ejects a particle, or energy, and the atom becomes more stable. That process is known as radioactive decay. The ejected particle or energy is the radiation; the atom that decays is known as a radionuclide (57).

The ejected particle or energy may be one of three types of radiation: alpha particles, beta particles, or gamma rays. When radioactive decay occurs, the radiation produced can interact with nearby objects. During that interaction, energy is transferred from the ejected radiation to the object of interaction. Radiation dose, measured in rad or gray, is the amount of energy transferred from the radiation to the object. Other terms, rem or sievert, express radiation dose to people.

Radiation arises from materials that emit penetrating gamma radiation and other types of shorter-range radiation particles. The penetrating gamma rays and other types of shorter-range radiation particles interact with material and cause ionizations. The number of ionizations that occur in a given volume of air indicates the amount of radiation present in the nearby area. By counting the number of ionizations in a gamma radiation detector, the presence of gamma-emitting radionuclides can be determined.

When ionizing radiation travels through the body, it can change the structure of molecules in the body. The changed molecular structure can:

- in some cases be repaired
- lead to impaired physiological function
- lead to a different physiological function
- or change the genetic code for future cells, tissues, and organs.

Cells which repair their molecular structure behave as normal, unaffected cells in the body. Cells which do not repair their molecular structure can have an impaired or different function. That is unrepaired molecules within a cell can lead to abnormal cellular behavior within the body. If the impaired function of a cell is severe enough, it can lead to the death of that cell (i.e., cellular death).

At moderate to high dose rates of radiation (acute exposure), the number of cellular deaths may overwhelm the body leading to the death of the individual. At low dose rates of radiation (chronic exposure), the body can recover from the death of cells caused by impaired physiological function, but those cells which are not repaired and survive with an impaired or different function can be a source of mutations. Cancer is believed to be the predominant form of cellular mutation associated with chronic radiation exposures. The radiation dose rates at Hunter's Point Annex are

low-level, chronic exposure levels.

APPENDIX F

Radium/Radon Fact Sheet

Radium/Radon

Radium is a naturally-occurring silvery white radioactive metal that can exist in several forms called isotopes. It is formed when uranium and thorium (two other natural radioactive substances decay (break down) in the environment. Radium has been found at very low levels in soil, water, rocks, coal, plants, and food. For example, a typical amount might be one picogram of radium per gram of soil or rock. This would be about one part of radium in one trillion (1,000,000,000,000) part of rock. These levels are not expected to change with time (129).

Some of the radiation from radium is constantly being released into the environment. It is this release of radiation that causes concern about the safety of radium and all other radioactive substances. Each isotope of radium releases radiation at its own rate. One isotope, radium-224 for example, releases half of its radiation in about three and a half days; whereas another isotope, radium-226, releases half of its radiation in about 1,600 years (129).

EPA has classified Ra-226 and all radionuclides as class A carcinogens (130). The major health effects resulting from internally deposited Ra-226 are noted in cases dealing with occupational exposure, the majority being radium dial painters. The major type of radiation inducing damage from internally deposited Ra-226 is the alpha particle. This decay particle travels very short distances and the majority, if not all of its energy is absorbed within the structure where Ra-226 is deposited. As most of the ingested Ra-226 deposits in bones, the greatest exposure and dose is delivered to bone surfaces and perhaps the blood-forming bone marrow.

Studies have shown that internal deposition of Ra-226 results in the induction of skeletal tumors and paranasal sinus carcinomas (cancer of the sinus cavities) (131, 132). Argonne National Laboratory and its Center for Human Radiobiology over 20 years. Stebbings, et al (1984) reported that in U.S. white females employed as dial painters, the rates of liver, cervical, and uterine cancers were not related to radium exposure (133). Some cancers of the digestive system may have been indirectly related to radium exposure. They reported that although there was an increase in multiple myeloma (a form of leukemia), indications were that this increase was related more to the length of employment than the amount of radium in the body. This indirectly suggests the myeloma may be due to the external exposure to the gamma radiation emitted during the radioactive decay of Ra-226.

As of 1984, almost 6,000 individuals with all types of exposure to radium had been located throughout the United States (134). Of these numbers, 1,907 dial painters had been located and the radium body burden measured. In this group, there were 44 cases of bone tumors and 19 cases of sinus or mastoid (associated with the head) carcinomas. These totals include 3 individuals with both types of illnesses. The study concluded that these illnesses and skeletal tissue deterioration were nevertheless unquestionably related to the presence of internal radium.

The decay product of Ra-226, Radon-222 also undergoes radioactive decay and has a radioactive half-life of about 4 days. This means that one-half of a given amount of radon will be changed or decayed to other products every 4 days. When radon decays, it divided into two parts. One part is called radiation, and the second part is called the daughter. The daughter, like radium, is not

stable; and it divides into radiation and another daughter. Unlike radon, the daughters are metal and easily attach to dust and other particles in the air. As with radium, the dividing continues until a stable, nonradioactive daughter is formed (129).

APPENDIX G

Radiation Calculations

To calculate a radiation dose, the amount of radiation one is exposed to needs to quantified. To quantify the exposure, ATSDR completed a pathway analysis and estimates of exposure were assessed.

ATSDR identified soil as a contaminated media due to past disposal of Ra-226 dials at the site, and incidental ingestion and irradiation as the routes of exposure for completed pathways. ATSDR then reviewed radiologic environmental data for areas at the site provided by the Navy. Those data were: gamma measurements (i.e., technically termed "exposure measurements") and soil samples. The gamma measurements were used to locate areas with elevated gamma levels (i.e., greater than background exposure rates).

Estimate of exposure by route of incidental soil ingestion

Once elevated gamma levels were located, soil samples where collected to determine the radionuclides in the soil and their quantities. Soil samples were also collected in areas without gamma levels to determine to natural background concentrations of radionuclides in soil at HPA. With this information, ATSDR was able to construct a histogram of the soil sampling results (figure 3). The histogram shows the distribution of radionuclide concentrations in soil with elevated gamma levels at HPA.

After obtaining the radionuclide distribution in soil, ATSDR calculated a weighted distribution of radionuclides in soil. The weighted distribution predicts the average amount of each radionuclide in soil. ATSDR calculated the weighted distribution by,

X = [(% nuclide in grouping) x (upper bound of that grouping)]

For example, for Ra-226 the weighted average **above background** was calculated as

X = (6.7%)(2.565) + (0.8%)(5.125) + (0.8%)(6.405) + (13.3%)(3905)

X = 519.629 pCi/gram

Similarly, the weighted distribution for the other radionuclides in soil is (pCi/gram): Am-241 (3.39), Cs-137 (1.2467), K-40 (4.12), Ra-228 (1.356), and Th-228 (1.1958).

ATSDR also estimated how many grams of soil is/was ingested per year at HPA. By combining the estimated number of grams of soil ingested with the predicted amounts of radionuclides in the soil, ATSDR can calculate amounts of radionuclides ingested per year at HPA.

The incidental ingestion calculations are as follows:

Ingestion rate - Note: 100 mg = 0.1 g

landfill operators

0.5 g_{soil}/day   x   8 hrs/16 hrs   x   5 days/week   x   50 weeks/yr   =   12.5 g_{soil}/yr

children

0.2 g_{soil}/day   x   1 hr/16 hrs   x   3 days/week   x   48 weeks/yr   =   4.5 g_{soil}/yr

Triple A workers

0.1 g_{soil}/day   x   1 hr/16 hrs   x   5 days/week   x   50 weeks/yr   =   1.56 g_{soil}/yr

base tenants

0.1 g_{soil}/day   x   1 hr/16 hrs   x   2 days/month   x   6 months/yr   x   0.75 g_{soil}/yr

trespassers

0.1 g_{soil}/day   x   2 hr/16 hrs   x   2 days/month   x   6 months/yr   =   0.15 g_{soil}/yr

Navy personnel

0.1 g_{soil}/day   x   2 hrs/16 hrs   x   1 day/week   x   48 weeks/yr   =   0.06 g_{soil}/yr

By multiplying together the ingestion rate and the weighted distribution of radionuclides in soil, ATSDR established the amount of each radionuclide incidentally ingested per year as the following:

Amounts of Radionuclide Exposure through Ingestion.

Radionuclide	Landfill	Child	Triple A	Base Tenants	Trespasser	Navy Personnel
Am-241	42.37	15.25	5.29	2.54	0.51	0.20
Cs-137	15.5884	5.6101	1.9448	0.9350	0.1870	0.0748
K-40	51.50	18.54	6.43	3.09	0.62	0.25
Ra-226	6495.312	2338.312	810.615	389.719	77.944	31.177
Ra-228	16.950	6.102	2.115	1.017	0.203	0.081
Th-228	14.9475	5.3811	1.8654	0.8968	0.1794	0.0717

                    NOTE: Above values are in

pCi/year
The ICRP recommendations specify an ALI, defined as the amount of a radionuclide that delivers the occupational effective-dose limit, 20 mSv (2,000 mRem) per year, from ingestion or inhalation exposures. Occupational ALI is calculated using the average career span of an occupationally exposed person -- 50 years. ICRP recommends using the average lifetime of an individual (70 years), and the public's effective-dose limit, 1 mSv (100 mrem) per year, to determine the public's ALI (PALI) by way of ingestion or inhalation.

The general formula for the ALI is:

> ALI = annual effective dose limit (2,000 mRem/yr)/committed effective dose in 50 years

and for exposures to the public:

> PALI = annual effective dose limit (100 mRem/year)/committed effective dose in 70 years

Determination of Dose

Internal Dose

The internal radiation dose received to someone is proportional to the amount of radionuclides in their body. By calculating the PALIs, ATSDR determined how much of a particular radionuclide delivers 100 mrem/year to the average person. By manipulating that, ATSDR can estimate doses for the proposed exposure scenarios at HPA. Radiation doses are estimated below for Ra-226.

Landfill operators

> 100 mrem/year /   81,000 pCi/year   x   6,495.312 pCi/year   =   8.02 mrem/year

Children

> 100 mrem/year   /   81,000 pCi/year   x   935.332 pCi/year   =   1.15 mrem/year
> and adjusting for the weight of the average child (16 kg)--
> 1.15 mrem/year   x   70 kg/16 kg   =   5.05 mrem/year

Triple A

> 100 mrem/year   /   81,000 pCi/year   x   810.615 pCi/year   =   1.00 mrem/year

Base Tenants

> 100 mrem/year   /   81,000 pCi/year   x   389.719 pCi/year   =   0.48 mrem/year

Trespassers

100 mrem/year   /   81,000 pCi/year   x   77.944 pCi/year   =   0.10 mrem/year

Navy personnel

100 mrem/year   /   81,000 pCi/year   x   31.177 pCi/year   =   0.04 mrem/year

Thus by comparing the PALI to the amount ingested, ATSDR determined doses for the scenarios presented earlier. ATSDR also noted that about 98% of the dose was due to Ra-226; therefore, ATSDR eliminated the other radionuclides as contaminants of concern. The reported dose is due solely from the incidental ingestion of Ra-226.

Exposed Population	Ingestion Rate	Calculated Internal Effective Dose
Landfill Operators	500 mgsoil/day	8.02 mrem/year
Children	200 mgsoil/day	1.15 mrem/year
Triple A Workers	100 mgsoil/day	1.00 mrem/year
Base Tenants	100 mgsoil/day	0.48 mrem/year
Trespassers	100 mgsoil/day	0.10 mrem/year
Navy Personnel	100 mgsoil/day	0.04 mrem/year

External Dose

Exposure measurements were also used to calculate the external gamma dose. The typical amount of Ra-226 in a dial was 1 μCi (51). The specific gamma ray constant ( ) for Ra-226 at 1 meter is 3.274 x 10^{-6} mSv/hr/MBq (1.2114 x 10^{-5} mrem/hr/μCi) (135). The external dose calculations are as follows for Ra-226:

1 μCi   x   1.2114   x 10^{-5} mrem/hr/μCi   =   1.2114 x 10^{-5} mrem/hr

landfill operators
1.2114   x 10^{-5} mrem/hr   x   8 hours/day   x   5 days/week   x   50 weeks/year   =   0.024 mrem/year

children
1.2114   x 10^{-5} mrem/hr@1m   x $(1\ m)^2/(0.5\ m)^2$ x   1 hr/day   x   3 day/week   x   48 weeks/year   =   0.07 mrem/year

Triple A workers
1.2114   x 10^{-5} mrem/hr   x   1 hr/day   x   5 days/week   x   50 weeks/year   =   0.003 mrem/year

Navy personnel
1.2114   x 10^{-5} mrem/hr   x   2 hrs/day   x   1 day/week   x   48 weeks/year   =   0.001 mrem/year

trespassers
1.2114   x 10^{-5} mrem/hr   x   2 hrs/day   x   2 days/month   x   6 months/year   =   0.0003 mrem/year

base tenants
1.2114   x 10^{-5} mrem/hr   x   1 hr/day   x   2 days/month   x   6 months/year   =   0.0001 mrem/year

APPENDIX H

Comments from the Public Comment Period

The following comments were received by ATSDR in response to the public comment period for the Naval Station Treasure Island, Hunters Point Annex Public Health Assessment. This list of comments does not include editorial comments concerning word spellings, sentence syntax, etc. It does not include comments on the accuracy of stated facts. If the accuracy of a statement was questioned, the statement was verified or corrected. ATSDR received several comments from the Navy regarding air monitoring, methane, groundwater, indoor air, food chain, and comparison values. No other public comments were received. ATSDR has addressed these in categories. Categories and comments are in bold as they appeared in the document. References cited are listed in the body of the document.

AIR MONITORING

What is the location of the upwind background air monitoring station and the source of the air-borne pesticides?

Pesticides were detected at air monitoring Station 11, an upwind background air sampling station. According to the map enclosed in the Navy's Draft Final Air Monitoring Report and Work Plan, Station 11 is outside of IR-1/21 boundaries, but still within the base boundary. According to the Navy, although not within an IR boundary, the area on which Station 11 was located is suspected of containing contaminants similar to those found at IR-1/21 (62). ATSDR stated that the source of the air-borne pesticides is unknown. ATSDR would like to know the source of these pesticides whether on or off base. ATSDR is concerned that the levels of pesticides in the air may be hazardous to tenants that work or who are involved in outdoors activities downwind of air monitoring Station 11.

INDOOR AIR

Tenants have not had long term exposures to possible contaminants in HPA buildings. Tenants have occupied HPA only on a short term basis.

Triple A leased HPA from the Navy during the mid 1970s. Triple A then subleased buildings to tenants, and some of those tenants are still leasing buildings. There is no record that the buildings were decontaminated before tenants moved into HPA buildings. Some of those buildings were used for industrial activities or waste generating activities could have taken place. Appendix D lists the past uses of some buildings and areas. Certain tenants could have occupied HPA over 10 years, which is adequate time for chronic exposures to have occurred. An inventory of past use records would help to determine if waste generating activities took place in currently leased buildings. If contamination is possible, then ATSDR recommends the current use be determined to decide if sampling is warranted. Since some artists lease HPA buildings and may use hazardous materials to create some of their work, those activities should be factored into sampling decisions. Indoor air sampling and wipe samples will help to determine if buildings are safe for current and future tenants.

FOOD CHAIN

Why does ATSDR believe that fish and shellfish are bioaccumulating contaminants detected at HPA?

Contaminants that bioaccumulate in aquatic organisms have been detected in storm drains, sediments, and bay water. ATSDR believes that these contaminants could be bioaccumulating in fish and shellfish because of the nature of the contaminants found at HPA. PCBs were detected in storm drain, sediments, and in ESAP test organisms. PCBs are closely related to many chlorinated hydrocarbon pesticides (e.g., DDT, dieldrin, and aldrin) in their chemical, physical, and toxicologic properties and their widespread occurrence in the aquatic environment. Because of their near complete absorption, high lipid solubility, low water solubility, and relative chemical inertness, PCBs tend to concentrate in the food chain. PCBs have a bioconcentration factor of 31,200 (3% lipid) weighted average l/kg.

Due to the lack of information for oral exposure to inorganic lead, the EPA Office of Water has not included lead as a recommended target analyte in fish and shellfish contaminant monitoring programs at this time (67). Children are especially sensitive to lead's toxicity. Because lead is ubiquitous in the environment, many children have elevated blood lead concentrations approaching those believed to cause adverse health effects (10 μg/dL). Therefore, the Navy should continue to include lead as a target analyte in fish and shellfish contaminant programs if there is any evidence that this metal may be present at detectable levels in fish or shellfish tissue and children are consuming fish (67). Lead has a bioconcentration factor of 49 (3% lipid) weighted average l/kg.

ESAP mussel tissue control data was not provided to ATSDR, therefore, ATSDR has no comparison for the test organisms. When the Navy provides the ESAP control data, ATSDR will be better able to determine if ESAP test organisms bioaccumulated HPA contaminants.

The RWCQB initiated a pilot study of San Francisco Bay to determine whether fin fish are contaminated. The Southern Basin, just south of HPA and north of Candlestick Park, was one of the study areas. Fin fish were collected in the spring of 1994, and the fillets are being analyzed. Results should be available later in 1994. Only a limited number of fish were caught and analyzed. When it becomes available, the RWCQB fish data will assist in determining whether fin fish are bioaccumulating contaminants associated with HPA. Data on shellfish caught at HPA is still needed before ATSDR can determine if bioaccumulation is occurring.

METHANE

Does methane represent a physical hazard to remediation workers and others?

The IR-18 methane pocket is beyond the base boundary. The magnitude and extent of the pocket off site is unknown and might present a hazard to people. Methane represents a physical hazard because it may cause explosions and it may displace air and cause asphyxiation. Methane occurrence in other areas is not as close to the fence line and may not present a hazard to people off site, but could pose a problem for utility and construction workers on site. Methane gas was detected in 7 samples at various levels at concentrations ranging from 0.5 to 83 percent. The lower explosive limit for methane is 5% and the upper explosive limit is 15%.

People or workers performing intrusive subsurface activities at HPA are at greatest risk for methane explosions. The extent and magnitude of the on-site pockets have not been determined.

Areas where methane has been detected should be clearly marked to indicate where the hazards exists. Methane was also detected at IR-1/21, IR-2, IR-3, IR-7, and IR-12. When methane pockets are encountered by remediation workers, the pockets are allowed to off-gas.

The Navy has an occupational safety program for their personnel which includes remediation workers at HPA. The Navy's program does not include city utility workers who may be involved with installing new utility lines at HPA especially when land is turned over for development. While the risk for remediation workers is unavoidable, hazardous areas should be posted to ensure that utility workers do not disturb methane pockets.

GROUNDWATER

The nearest well to HPA on the same side of the bedrock ridge as IR-6 and IR-10 (Well 197) is located one mile to the northwest, and would not influence of be influenced by groundwater conditions at HPA. Neighboring areas are topographically upgradient of HPA. Given the absence of water wells near HPA, the unconfined conditions in the shallow aquifer and the groundwater flow directions (36) these areas are also hydrologically upgradient of HPA. Thus, the presence of chemicals in groundwater at HPA does not represent a potential current pathway.

Potential exposures to hypothetical future users are highly unlikely. The text section states the plumes might be induced to flow opposite their natural direction due to industrial well use. First this supposes the existence of industrial wells near HPA; this is not currently the case and is not likely to be so in the future, given the limited nature of the groundwater resource in this area, its marginal quality, and the availability of high-quality alternatives (i.e., the city's Hetch Hetchy reservoir). Second, even if such a well did exist immediately adjacent to HPA and was actively pumping, it would not affect the IR-6 and IR-10 plumes. It is extremely unlikely that any off-site current or hypothetical future groundwater users could be exposed to IR-6 and IR-10 groundwater.

ATSDR agrees with this information. If any groundwater is being used in the HPA area, ATSDR believes use is limited. Even if people are using groundwater the risk of contamination is decreased by the patterns of groundwater movement and plume movement away from Hunters Point/Bayview. If other environmental data indicate people are being exposed to hazardous substances in groundwater become available, ATSDR will reevaluate the pathway, but it currently poses no apparent health hazard.

COMPARISON VALUES

Where do ATSDR comparison values come from and how are they used?

ATSDR uses comparison values to screen environmental data for levels present that may present potential health hazards. Comparison values do not predict the occurrence of a public health hazard. The listing of a contaminant of the exceedance of a comparison value do not necessarily mean that unsafe conditions or adverse health effects have occurred or will occur. Instead, the list indicates those contaminants that will be evaluated further.

Several comparison values may exist for each contaminant. Environmental Media Evaluation Guides (EMEGs) and Cancer Risk Evaluation Guides (CREGs) are generally the first choice ATSDR uses for comparison values.

If a contaminant is a suspected carcinogen, CREGS are used. Each guide represents a concentration of a carcinogen in a specific environmental medium and assist in determining whether the carcinogen should be selected for further evaluation. CREGs are based upon five elements: 1) a cancer slope factor; 2) a specific risk believed to be reasonably protective of health (i.e., standard or acceptable risk); 3) an adult body weight; 4) an adult intake rate; 5) and an assumption of daily exposure over a lifetime.

EMEGs are media specific comparison values that are used to select contaminants of concern. EMEGs have been developed for chemicals for which ATSDR has developed Toxicological Profiles. These chemicals were selected because of their toxicity, frequency-of-occurrence at sites or facilities on the National Priorities List, and potential for human exposure to the substance. EMEGs are derived from the Minimal Risk Levels presented in the ATSDR Toxicological Profiles.

If no chronic EMEGs are available, ATSDR health assessors may need to use, derive or consider other comparison values for non carcinogen effects from available health guidelines. Some of the other comparison values can include the Reference Media Evaluation Guide, Intermediate EMEG, and EPA Lifetime Health Advisory.

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